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MOGADISHU WATER SUPPLY

EXPANSION

AFGOOYE ROAD WELLFIELD

STAGE IIA

ADDENDUM

This addendum is prepared for
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Nairobi

Kenya

by

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Wallingford

Oxon

UK

November 1984

This addendum to our report of December 1983 on the Afgooye Road Wellfield presents the data that was outstanding at that time ie the redrilling of wells PW30B and PW19A and the pump testing of those wells with PW12, 17A and 18. These data complete the report on Stage IIA of the wellfield.

The data listings give the construction details of all five wells and the results of the step test pumping, in addition the geophysical logs of the two redrilled wells are also shown.

Figure 1 shows the yield depression curves for all the Stage IIA wells with the five recent tests shown in bolder lines. The two redrilled wells, PW19A and PW30B, have characteristics which fall within the main group of wells which have drawdowns of less than 7 metres at the design production rate of 60 m³/hr. As can be seen PW18 has the worst yield depression characteristics with a drawdown of nearly 16.5m at the design yield, although this should be compared with the available drawdown of over 35 m for that well.

Yield depression curves

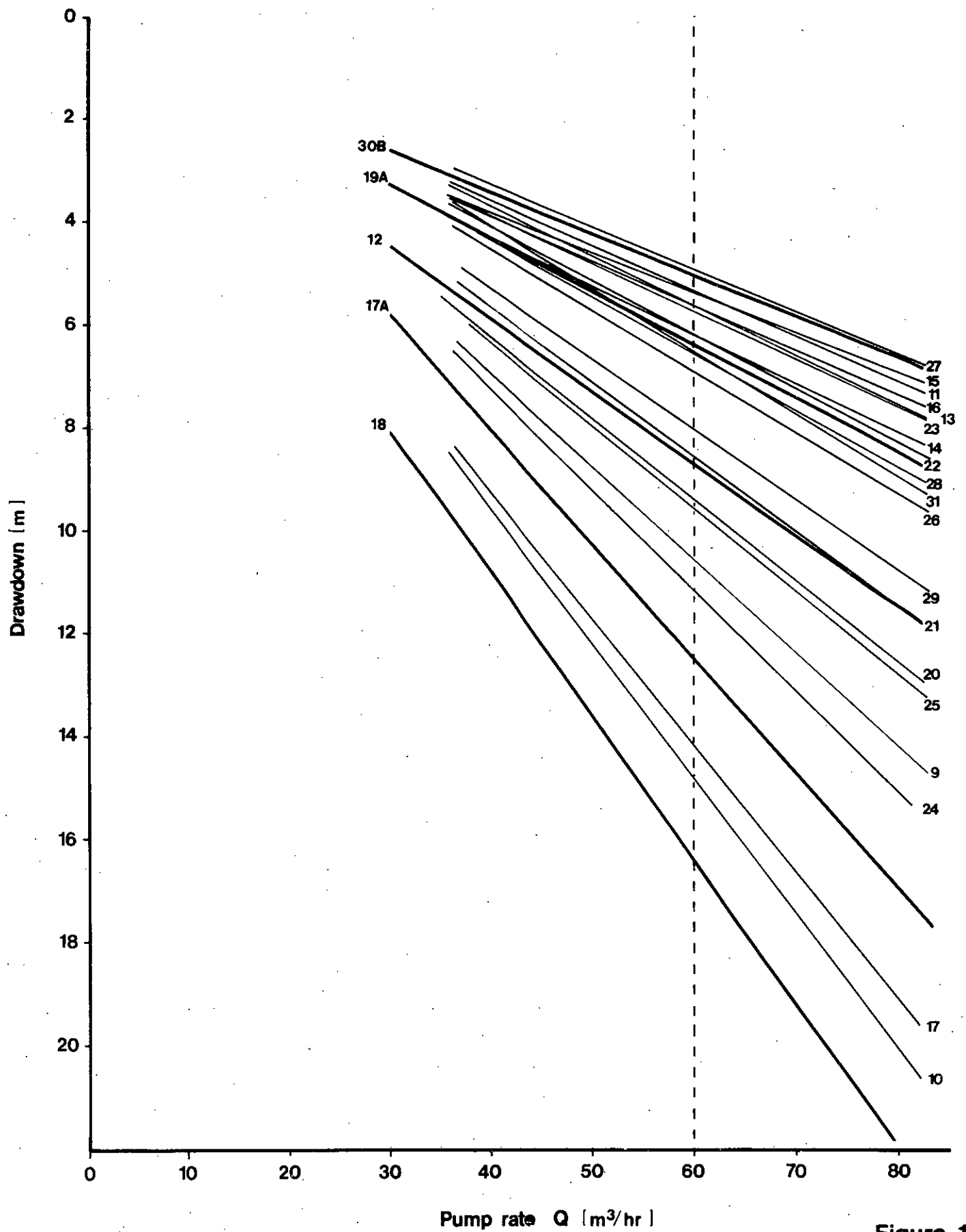


Figure 1

MUQDISHO WATER SUPPLY
SITE LOCATION INDEX
STAGE IIA

GRID REF WELL NUMBER

52072277	PW308	AFGOOYE RD. WELLFIELD (SOUTH SIDE) REPLACEMENT WELL
52222293	PW 18	AFGOOYE RD. WELLFIELD (SOUTH SIDE)
52252296	PW 17A	AFGOOYE RD. WELLFIELD (SOUTH SIDE) 80M NORTH OF PW 17
52312298	PW19A	AFGOOYE RD. WELLFIELD (SOUTH SIDE) REPLACEMENT WELL
52322301	PW 12	AFGOOYE RD. WELLFIELD (SOUTH SIDE)

MUQDISHO WATER SUPPLY
SITE SUMMARY
STAGE IIA

GRID REF WELL NUMBER	52072277 PW305	52222293 PW 18	52252296 PW 17A	52312298 PW19A	52322301 PW 12
AREA	1	1	1	1	1
AQUIFER	2	2	2	2	2
SOURCE	5	6	6	6	6
CONTRACTOR	PIHL	PIHL	PIHL	PIHL	PIHL
CONSTR. DATE	31 JAN 84	18 APR 83	3 NOV 83	31 AUG 84	22 FEB 83
DEPTH	210.000	206.800	210.000	205.000	210.200
DATUM		140.000			144.000
CASING TYPE	STEEL	STEEL	STEEL	STEEL	STEEL
DIAMETER	0.254	0.254	0.254	0.254	0.254
SCREEN TYPE	.4MM SWIRE	.4MM SWIRE	.4MM SWIRE	.4MM SWIRE	.4MM SWIRE
DIAMETER	0.203	0.203	0.203	0.203	0.203
SCREENS	1	1	1	1	1
DEPTH 1	170.000	159.000	170.400		163.000
LENGTH 1	30.000	30.000	30.000	30.000	30.000
DEPTH 2					
LENGTH 2					

PROJECT

MOGADISHU WATER SUPPLY

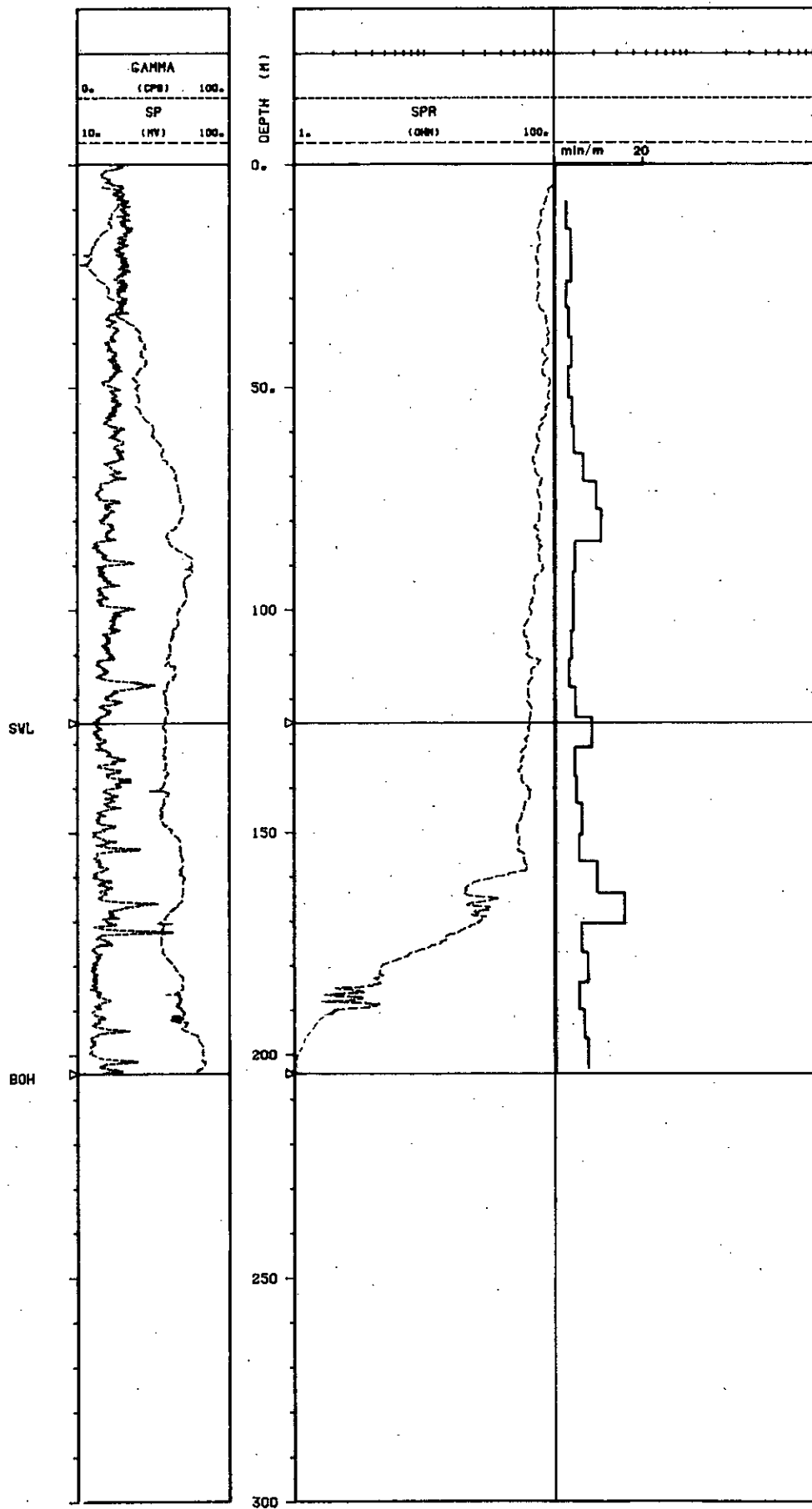
BOREHOLE

PW19A

GRID REF

52312298

DATUM ELEVATION



PROJECT

MOGADISHU WATER SUPPLY

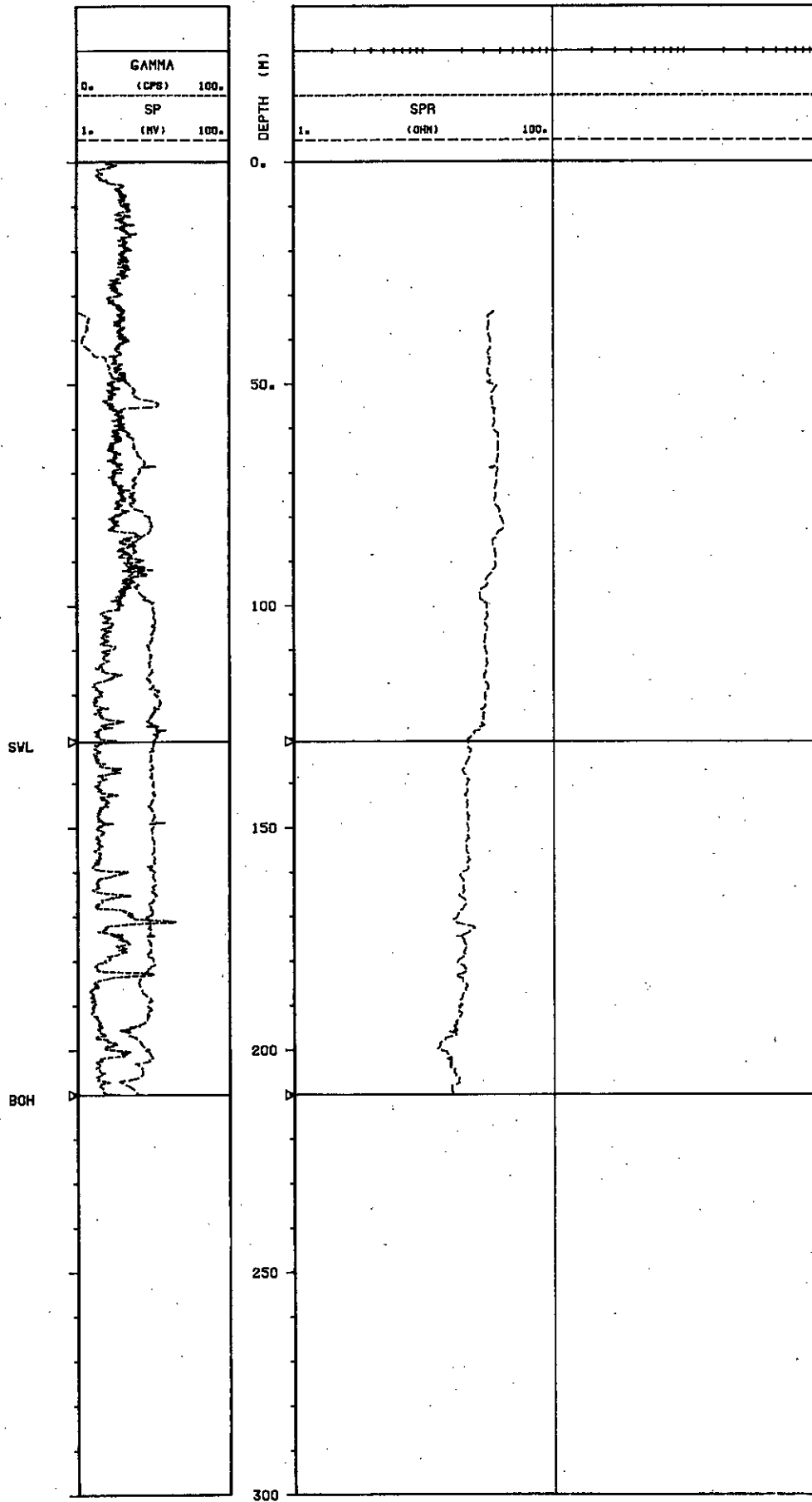
BOREHOLE

PW30B

GRID REF

52072277

DATUM ELEVATION



MUGDISHO WATER SUPPLY STAGE IIA						
STEP DRAWDOWN TEST - PW 12						
DATE 20-12-83						
PUMPING AT PW 12 CRID REFERENCE 52322301						
DEPTH TO REST WATER LEVEL = 128.315 METRES						
PUMPING RATES	0 MINS.	TO 120 MINS.	TO 240 MINS.	TO 360 MINS.	TO 480 MINS.	TO 600 MINS.
9600 M ³ /DAY FROM 1200 M						
12000 M ³ /DAY FROM 1200 M						
14400 M ³ /DAY FROM 2400 M						
16800 M ³ /DAY FROM 3600 M						
19200 M ³ /DAY FROM 4800 M						
0.00						
2.00						
4.00						
6.00						
8.00						
10.00						
12.00						
14.00						
16.00						
18.00						
20.00						

STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT

PW 12 GRID REF. 52322301

DATE OF TEST

20 12 83

PUMPING RATES (M**3/DAY) :

960.0 FROM	0.0 MINS TO	120.0 MINS
1200.0 FROM	120.0 MINS TO	240.0 MINS
1440.0 FROM	240.0 MINS TO	360.0 MINS
1680.0 FROM	360.0 MINS TO	480.0 MINS
1920.0 FROM	480.0 MINS TO	600.0 MINS

REST WATER LEVEL 128.315 METRES BELOW DATUM

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
1.0	7.940	125.0	7.310
2.0	6.090	126.0	7.320
3.0	6.020	127.0	7.360
4.0	6.000	128.0	7.370
5.0	5.990	129.0	7.380
6.0	6.000	130.0	7.380
7.0	6.000	132.0	7.380
8.0	6.000	134.0	7.330
9.0	6.000	136.0	7.340
10.0	6.000	138.0	7.350
12.0	6.000	140.0	7.370
14.0	6.000	142.0	7.350
16.0	6.010	144.0	7.350
18.0	6.000	146.0	7.390
20.0	6.010	148.0	7.410
22.0	6.010	150.0	7.390
24.0	6.010	155.0	7.390
26.0	6.020	160.0	7.390
28.0	6.020	165.0	7.390
30.0	6.020	170.0	7.380
35.0	6.000	175.0	7.390
40.0	6.010	180.0	7.390
45.0	6.010	190.0	7.330
50.0	6.020	200.0	7.320
55.0	6.010	210.0	7.330
60.0	6.020	220.0	7.320
70.0	6.020	230.0	7.320
80.0	6.020	240.0	7.340
90.0	6.040	241.0	8.430
100.0	6.040	242.0	8.630
110.0	6.040	243.0	8.640
120.0	6.040	244.0	8.640
121.0	7.220	245.0	8.640
122.0	7.270	246.0	8.650
123.0	7.280	247.0	8.650
124.0	7.290	248.0	8.650

(CONTINUED)

MUQDISHO WATER SUPPLY

STAGE IIA

STEP DRAWDOWN TEST -

PUMPED WELL

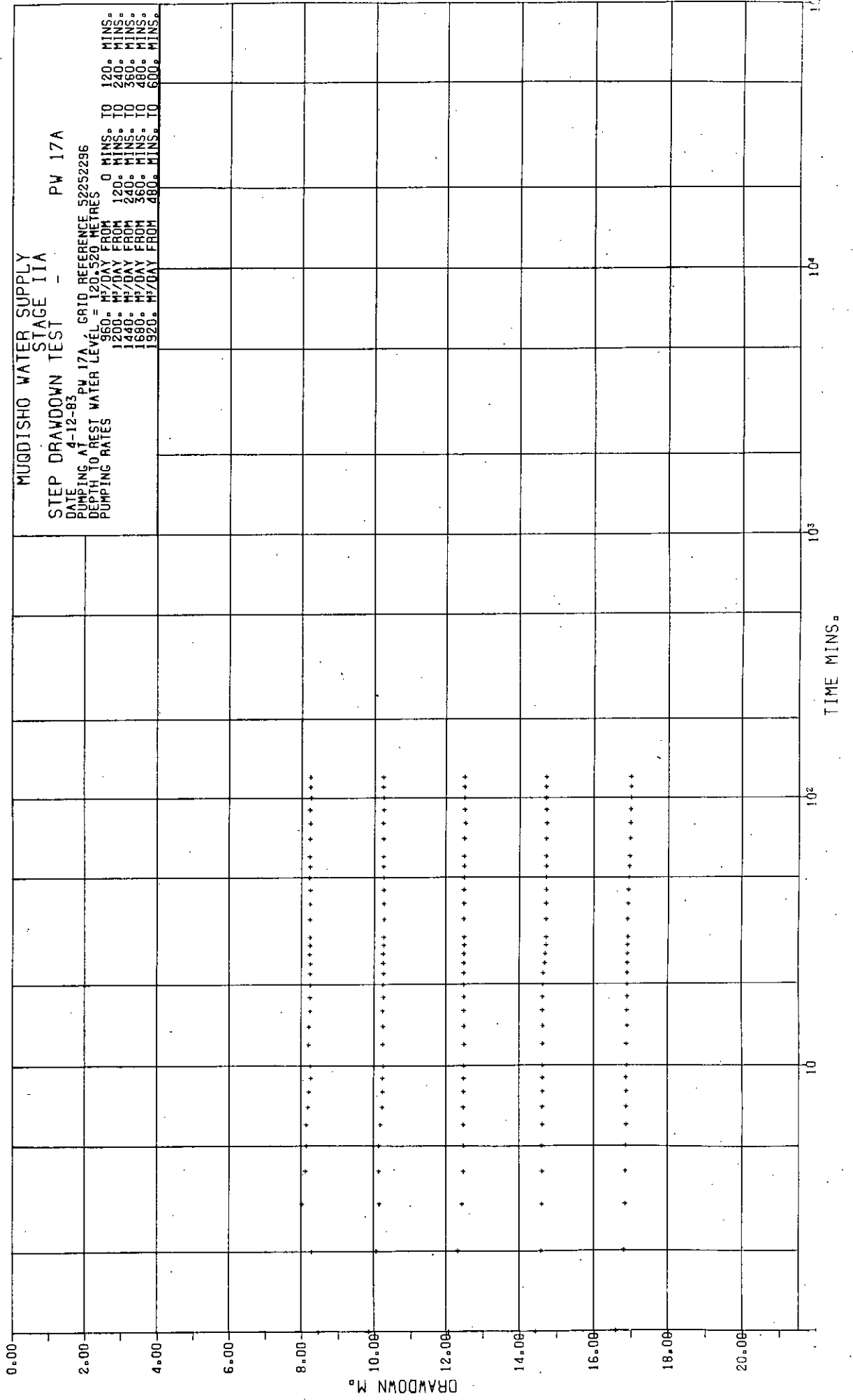
PUMPING AT

PW 12 GRID REF. 52322301

DATE OF TEST

20 12 83

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
249.0	8.640	415.0	10.000
250.0	8.650	420.0	9.990
252.0	8.650	430.0	9.980
254.0	8.660	440.0	9.980
256.0	8.660	450.0	9.940
258.0	8.660	460.0	9.950
260.0	8.640	470.0	9.950
262.0	8.650	480.0	9.940
264.0	8.650	481.0	11.290
266.0	8.630	482.0	11.350
268.0	8.660	483.0	11.370
270.0	8.650	484.0	11.450
275.0	8.650	485.0	11.420
280.0	8.660	486.0	11.430
285.0	8.650	487.0	11.450
290.0	8.650	488.0	11.450
295.0	8.650	489.0	11.450
300.0	8.650	490.0	11.450
310.0	8.640	492.0	11.460
320.0	8.640	494.0	11.460
360.0	8.630	496.0	11.430
361.0	9.830	498.0	11.430
362.0	9.900	500.0	11.460
363.0	9.930	502.0	11.430
364.0	9.960	504.0	11.430
365.0	9.970	506.0	11.450
366.0	9.970	508.0	11.430
367.0	9.970	510.0	11.460
368.0	10.000	515.0	11.460
369.0	10.020	520.0	11.430
370.0	10.020	525.0	11.430
372.0	10.010	530.0	11.460
374.0	10.030	535.0	11.460
376.0	10.030	540.0	11.430
388.0	10.030	550.0	11.430
390.0	10.000	560.0	11.460
395.0	10.000	570.0	11.460
400.0	10.010	580.0	11.460
405.0	10.000	590.0	11.470
410.0	9.990	600.0	11.470



STEP DRAWDOWN TEST - PUMPED WELL

PUMPING AT PW 17A GRID REF. 52252296

DATE OF TEST 4 12 83

PUMPING RATES (M**3/DAY) :

960.0 FROM	0.0 MINS TO	120.0 MINS
1200.0 FROM	120.0 MINS TO	240.0 MINS
1440.0 FROM	240.0 MINS TO	360.0 MINS
1680.0 FROM	360.0 MINS TO	480.0 MINS
1920.0 FROM	480.0 MINS TO	600.0 MINS

REST WATER LEVEL 120.520 METRES BELOW DATUM

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
1.0	3.460	125.0	10.110
2.0	3.270	126.0	10.160
3.0	3.010	127.0	10.210
4.0	3.100	128.0	10.220
5.0	3.130	129.0	10.220
6.0	3.120	130.0	10.240
7.0	3.170	132.0	10.230
8.0	3.190	134.0	10.240
9.0	3.250	136.0	10.230
10.0	3.240	138.0	10.250
12.0	3.190	140.0	10.240
14.0	3.210	142.0	10.260
16.0	3.240	144.0	10.250
18.0	3.240	146.0	10.250
20.0	3.250	148.0	10.260
22.0	3.240	150.0	10.260
24.0	3.250	155.0	10.270
26.0	3.230	160.0	10.270
28.0	3.240	165.0	10.260
30.0	3.240	170.0	10.260
35.0	3.240	175.0	10.250
40.0	3.240	180.0	10.250
45.0	3.250	190.0	10.250
50.0	3.220	200.0	10.240
55.0	3.240	210.0	10.260
60.0	3.230	220.0	10.250
70.0	3.240	230.0	10.240
80.0	3.250	240.0	10.240
90.0	3.230	241.0	12.070
100.0	3.260	242.0	12.320
110.0	3.240	243.0	12.430
120.0	3.240	244.0	12.470
121.0	9.350	245.0	12.470
122.0	10.050	246.0	12.470
123.0	10.130	247.0	12.470
124.0	10.110	248.0	12.480

STAGE IIA

STEP DRAWDOWN TEST - PUMPED WELL

PUMPING AT PW 17A GRID REF. 52252296

DATE OF TEST 4 12 83

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
249.0	12.480	388.0	14.730
250.0	12.480	390.0	14.730
252.0	12.490	395.0	14.730
254.0	12.490	400.0	14.730
256.0	12.490	405.0	14.730
258.0	12.490	410.0	14.730
260.0	12.490	415.0	14.730
262.0	12.490	420.0	14.730
264.0	12.490	430.0	14.730
266.0	12.490	440.0	14.740
268.0	12.500	450.0	14.730
270.0	12.500	460.0	14.720
275.0	12.490	470.0	14.720
280.0	12.490	480.0	14.720
285.0	12.490	481.0	16.600
290.0	12.500	482.0	16.820
295.0	12.500	483.0	16.850
300.0	12.500	484.0	16.860
310.0	12.500	485.0	16.870
320.0	12.530	486.0	16.880
330.0	12.510	487.0	16.880
340.0	12.500	488.0	16.880
350.0	12.500	489.0	16.880
360.0	12.500	490.0	16.900
361.0	14.430	492.0	16.890
362.0	14.580	494.0	16.910
363.0	14.600	496.0	16.900
364.0	14.610	498.0	16.910
365.0	14.600	500.0	16.910
366.0	14.620	502.0	16.910
367.0	14.620	504.0	16.910
368.0	14.630	506.0	16.910
369.0	14.630	508.0	16.910
370.0	14.630	510.0	16.920
372.0	14.630	515.0	16.910
374.0	14.640	520.0	16.920
376.0	14.630	525.0	16.930
378.0	14.630	530.0	16.950
380.0	14.640	535.0	16.960
382.0	14.650	540.0	16.970
384.0	14.690	550.0	16.980
386.0	14.710	560.0	16.990

(CONTINUED)

MUQDISHO WATER SUPPLY

STAGE IIA

STEP DRAWDOWN TEST -

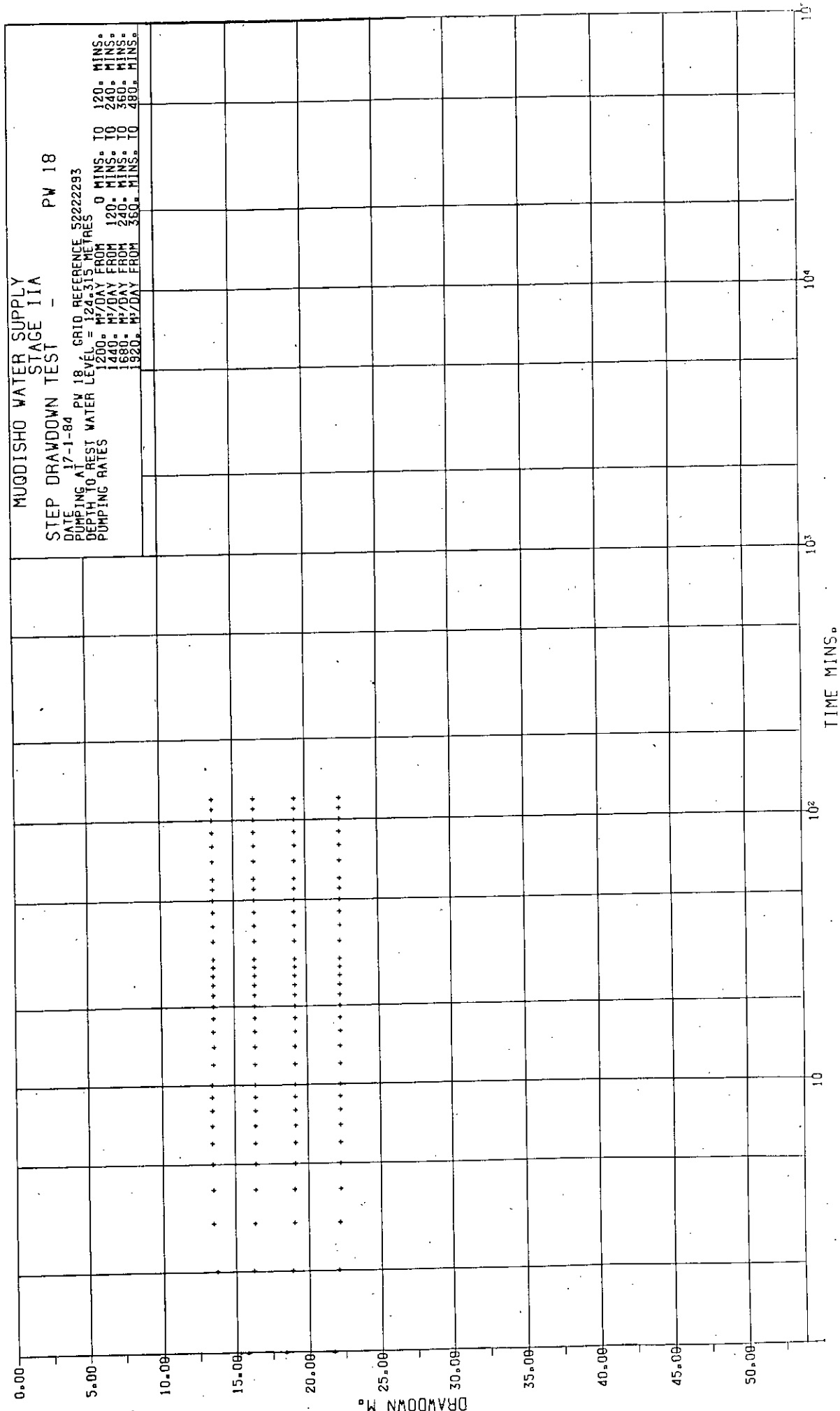
PUMPED WELL

PUMPING AT PW 17A GRID REF. 52252296

DATE OF TEST

4 12 83

TIME(MINS)	DRAWDOWN(M)
570.0	16.990
580.0	17.000
590.0	17.000
600.0	17.000



STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT PW 18 GRID REF. 52222293

DATE OF TEST 17 1 84

PUMPING RATES (M**3/DAY) :

1200.0 FROM 0.0 MINS TO 120.0 MINS
 1440.0 FROM 120.0 MINS TO 240.0 MINS
 1680.0 FROM 240.0 MINS TO 360.0 MINS
 1920.0 FROM 360.0 MINS TO 480.0 MINS

REST WATER LEVEL 124.315 METRES BELOW DATUM

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
1.0	15.210	125.0	16.390
2.0	13.690	126.0	16.370
3.0	13.460	127.0	16.390
4.0	13.470	128.0	16.400
5.0	13.440	129.0	16.400
6.0	13.410	130.0	16.390
7.0	13.420	132.0	16.400
8.0	13.420	134.0	16.400
9.0	13.420	136.0	16.400
10.0	13.420	138.0	16.400
12.0	13.530	140.0	16.390
14.0	13.570	142.0	16.390
16.0	13.530	144.0	16.390
18.0	13.550	146.0	16.400
20.0	13.550	148.0	16.400
22.0	13.540	150.0	16.390
24.0	13.540	155.0	16.400
26.0	13.540	160.0	16.400
28.0	13.550	165.0	16.400
30.0	13.550	170.0	16.400
35.0	13.560	175.0	16.400
40.0	13.560	180.0	16.400
45.0	13.560	190.0	16.400
50.0	13.560	200.0	16.400
55.0	13.560	210.0	16.400
60.0	13.570	220.0	16.400
70.0	13.560	230.0	16.400
80.0	13.570	240.0	16.400
90.0	13.560	241.0	18.340
100.0	13.540	242.0	18.380
110.0	13.550	243.0	19.040
120.0	13.550	244.0	19.060
121.0	15.730	245.0	19.110
122.0	16.200	246.0	19.140
123.0	16.320	247.0	19.150
124.0	16.360	248.0	19.140

STAGE IIA

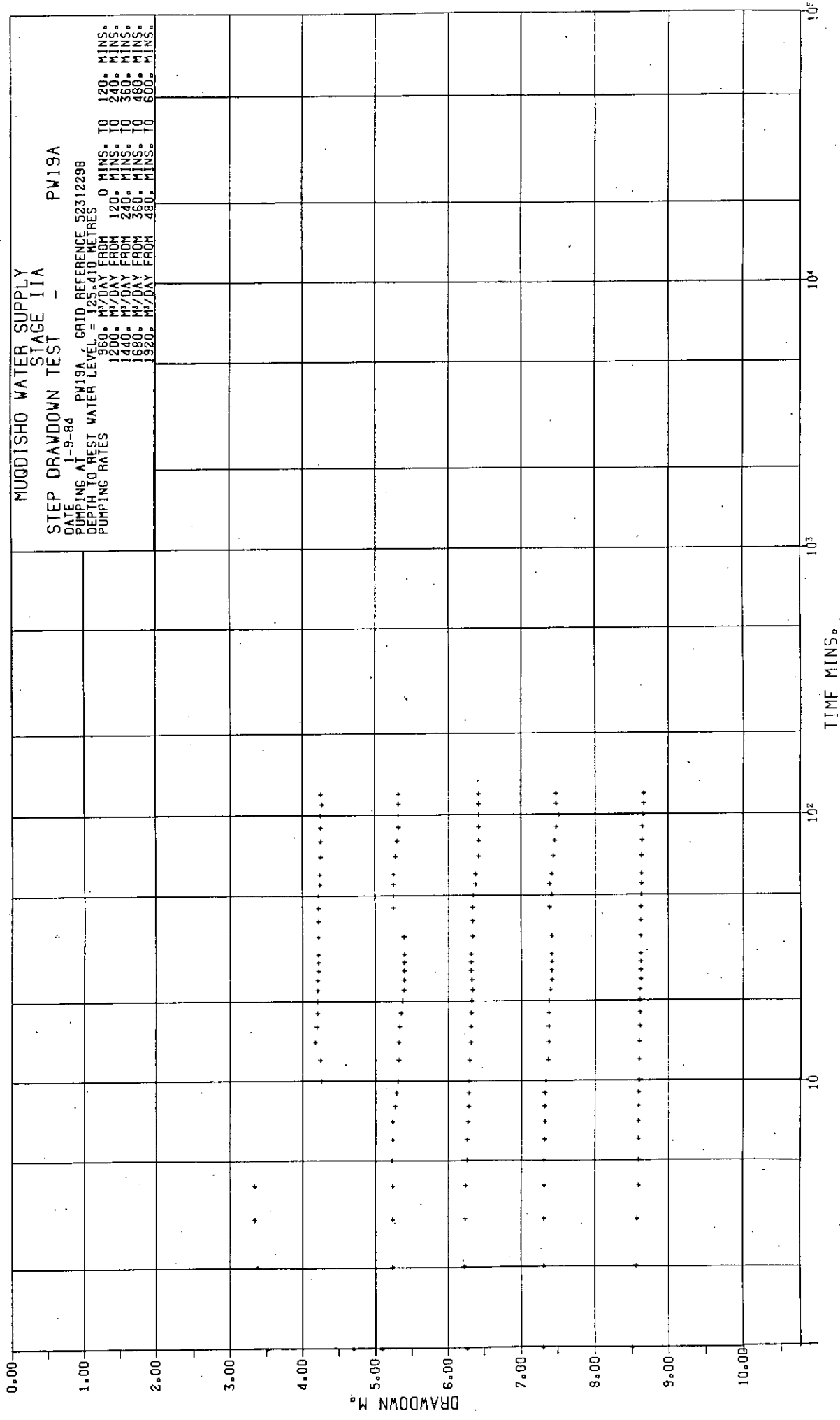
STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT PW 18 GRID REF. 52222293

DATE OF TEST 17 1 84

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
249.0	19.140	365.0	22.230
250.0	19.140	366.0	22.240
252.0	19.150	367.0	22.240
254.0	19.160	368.0	22.240
256.0	19.170	369.0	22.240
258.0	19.180	370.0	22.250
260.0	19.170	372.0	22.260
262.0	19.170	374.0	22.260
264.0	19.170	376.0	22.270
266.0	19.170	378.0	22.270
268.0	19.180	380.0	22.270
270.0	19.180	382.0	22.270
275.0	19.170	384.0	22.280
280.0	19.170	386.0	22.280
285.0	19.160	388.0	22.280
290.0	19.170	390.0	22.280
295.0	19.170	395.0	22.300
300.0	19.180	400.0	22.310
310.0	19.200	405.0	22.300
320.0	19.220	410.0	22.310
330.0	19.220	415.0	22.320
340.0	19.210	420.0	22.320
350.0	19.210	430.0	22.320
360.0	19.220	440.0	22.320
361.0	21.650	450.0	22.320
362.0	22.050	460.0	22.330
363.0	22.170	470.0	22.330
364.0	22.220	480.0	22.330



STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT

PW19A GRID REF. 52312298

DATE OF TEST

1 9 84

PUMPING RATES (M**3/DAY) :

960.0 FROM	0.0 MINS TO	120.0 MINS
1200.0 FROM	120.0 MINS TO	240.0 MINS
1440.0 FROM	240.0 MINS TO	360.0 MINS
1680.0 FROM	360.0 MINS TO	480.0 MINS
1920.0 FROM	480.0 MINS TO	600.0 MINS

REST WATER LEVEL 125.410 METRES BELOW DATUM

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
1.0	3.520	129.0	5.290
2.0	3.380	130.0	5.310
3.0	3.340	132.0	5.320
4.0	3.340	134.0	5.320
1.0	4.700	136.0	5.330
10.0	4.260	138.0	5.350
12.0	4.240	140.0	5.370
14.0	4.170	142.0	5.390
16.0	4.190	144.0	5.390
18.0	4.200	146.0	5.390
20.0	4.200	148.0	5.390
22.0	4.200	150.0	5.390
24.0	4.200	155.0	5.390
26.0	4.210	165.0	5.240
28.0	4.210	170.0	5.240
30.0	4.210	175.0	5.240
35.0	4.210	180.0	5.240
40.0	4.210	190.0	5.270
45.0	4.210	200.0	5.290
50.0	4.210	210.0	5.310
55.0	4.230	220.0	5.310
60.0	4.230	230.0	5.310
70.0	4.240	240.0	5.310
80.0	4.240	241.0	6.270
90.0	4.240	242.0	6.230
100.0	4.240	243.0	6.240
110.0	4.260	244.0	6.250
120.0	4.240	245.0	6.270
121.0	5.090	246.0	6.270
122.0	5.240	247.0	6.280
123.0	5.240	248.0	6.290
124.0	5.240	249.0	6.290
125.0	5.230	250.0	6.290
126.0	5.240	252.0	6.300
127.0	5.240	254.0	6.320
128.0	5.270	256.0	6.320

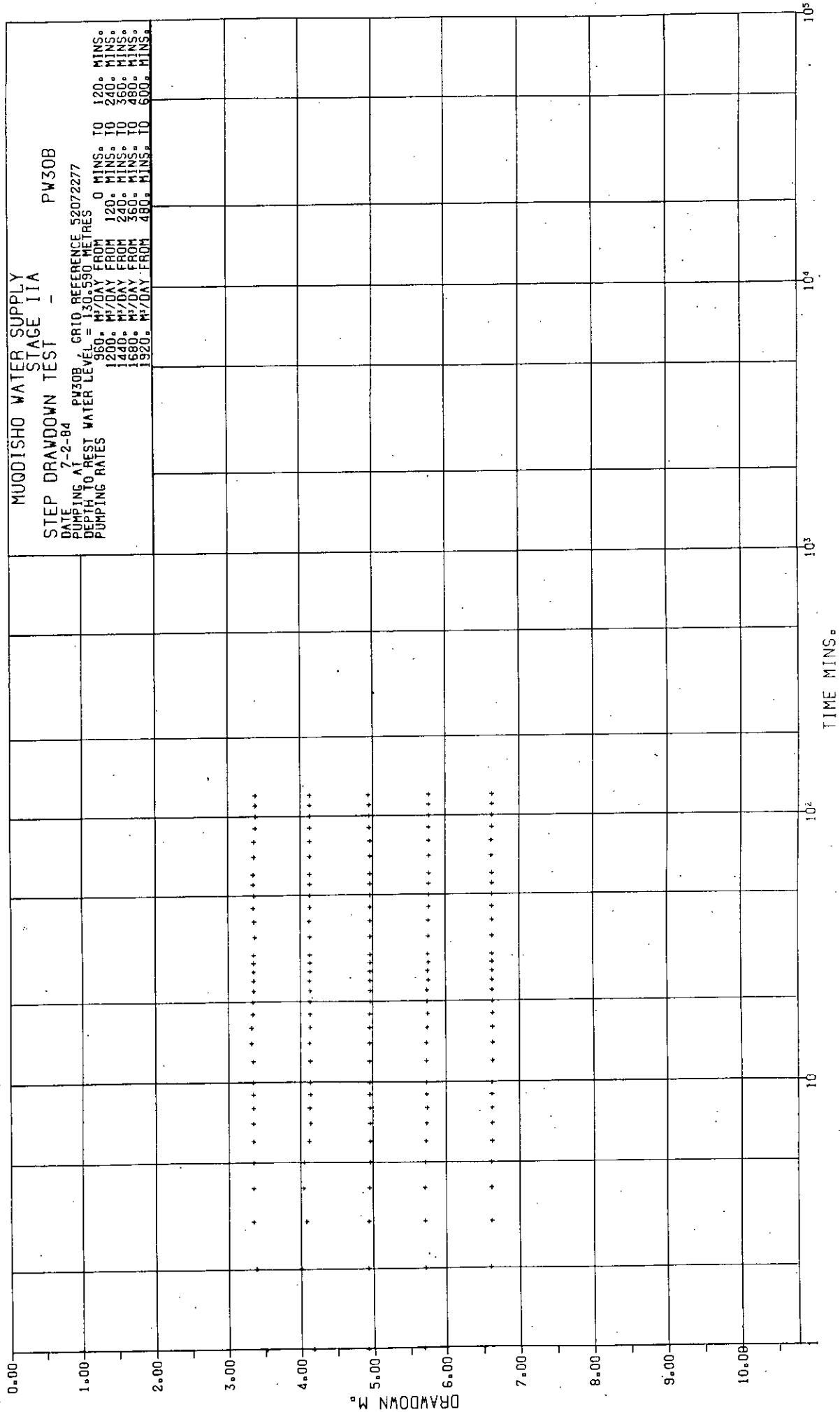
STAGE IIA

STEP DRAWDOWN TEST - PUMPED WELL

PUMPING AT PW19A GRID REF. 52312298

DATE OF TEST 1 9 84

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
258.0	6.320	410.0	7.410
260.0	6.330	415.0	7.380
262.0	6.340	420.0	7.410
264.0	6.330	430.0	7.430
266.0	6.320	440.0	7.450
268.0	6.320	450.0	7.470
270.0	6.320	460.0	7.510
275.0	6.340	470.0	7.470
280.0	6.340	480.0	7.470
285.0	6.340	481.0	8.510
290.0	6.350	482.0	8.560
295.0	6.380	483.0	8.570
300.0	6.380	484.0	8.590
310.0	6.420	485.0	8.590
320.0	6.420	486.0	8.590
330.0	6.420	487.0	8.590
340.0	6.420	488.0	8.590
350.0	6.420	489.0	8.590
360.0	6.420	490.0	8.600
361.0	7.300	492.0	8.600
362.0	7.310	494.0	8.600
363.0	7.310	496.0	8.610
364.0	7.310	498.0	8.610
365.0	7.310	500.0	8.610
366.0	7.320	502.0	8.610
367.0	7.320	504.0	8.620
368.0	7.320	506.0	8.620
369.0	7.320	508.0	8.620
370.0	7.330	510.0	8.620
372.0	7.360	515.0	8.620
374.0	7.370	520.0	8.620
376.0	7.370	525.0	8.620
373.0	7.370	530.0	8.630
380.0	7.370	535.0	8.630
382.0	7.390	540.0	8.630
384.0	7.410	550.0	8.630
386.0	7.410	560.0	8.640
388.0	7.410	570.0	8.640
390.0	7.410	580.0	8.650
395.0	7.410	590.0	8.660
405.0	7.380	600.0	8.660



STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT

PW305 GRID REF. 52072277

DATE OF TEST

7 2 84

PUMPING RATES (M**3/DAY) :

960.0 FROM	0.0 MINS TO	120.0 MINS
1200.0 FROM	120.0 MINS TO	240.0 MINS
1440.0 FROM	240.0 MINS TO	360.0 MINS
1680.0 FROM	360.0 MINS TO	480.0 MINS
1920.0 FROM	480.0 MINS TO	600.0 MINS

REST WATER LEVEL 130.590 METRES BELOW DATUM

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
1.0	3.520	125.0	4.040
2.0	3.330	126.0	4.110
3.0	3.340	127.0	4.130
4.0	3.340	128.0	4.120
5.0	3.340	129.0	4.130
6.0	3.340	130.0	4.130
7.0	3.340	132.0	4.130
8.0	3.340	134.0	4.120
9.0	3.340	136.0	4.130
10.0	3.340	138.0	4.130
12.0	3.340	140.0	4.130
14.0	3.320	142.0	4.130
16.0	3.320	144.0	4.120
18.0	3.340	146.0	4.130
20.0	3.340	148.0	4.130
22.0	3.350	150.0	4.130
24.0	3.350	155.0	4.130
26.0	3.350	160.0	4.120
28.0	3.350	165.0	4.130
30.0	3.350	170.0	4.130
35.0	3.370	175.0	4.130
40.0	3.360	180.0	4.130
45.0	3.350	190.0	4.130
50.0	3.360	200.0	4.130
55.0	3.350	210.0	4.130
60.0	3.350	220.0	4.130
70.0	3.360	230.0	4.130
80.0	3.360	240.0	4.130
90.0	3.380	241.0	4.920
100.0	3.380	242.0	4.920
110.0	3.380	243.0	4.930
120.0	3.330	244.0	4.940
121.0	4.170	245.0	4.950
122.0	4.000	246.0	4.950
123.0	4.070	247.0	4.950
124.0	4.030	248.0	4.950

STAGE IIA

STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT

PW308 GRID REF. 52072277

DATE OF TEST

7 2 84

TIME(MINS)	DRAWDOWN(M)	TIME(MINS)	DRAWDOWN(M)
249.0	4.950	388.0	5.760
250.0	4.950	390.0	5.750
252.0	4.950	395.0	5.760
254.0	4.950	400.0	5.760
256.0	4.950	405.0	5.770
258.0	4.950	410.0	5.770
260.0	4.960	415.0	5.770
262.0	4.960	420.0	5.770
264.0	4.960	430.0	5.770
266.0	4.960	440.0	5.770
268.0	4.960	450.0	5.770
270.0	4.960	460.0	5.770
275.0	4.960	470.0	5.770
280.0	4.960	480.0	5.770
285.0	4.960	481.0	6.510
290.0	4.960	482.0	6.600
295.0	4.960	483.0	6.610
300.0	4.960	484.0	6.610
310.0	4.960	485.0	6.610
320.0	4.960	486.0	6.620
330.0	4.950	487.0	6.620
340.0	4.950	488.0	6.620
350.0	4.950	489.0	6.620
360.0	4.940	490.0	6.620
361.0	5.690	492.0	6.630
362.0	5.710	494.0	6.630
363.0	5.700	496.0	6.630
364.0	5.700	498.0	6.630
365.0	5.710	500.0	6.630
366.0	5.720	502.0	6.630
367.0	5.730	504.0	6.630
368.0	5.740	506.0	6.630
369.0	5.730	508.0	6.630
370.0	5.730	510.0	6.630
372.0	5.730	515.0	6.630
374.0	5.730	520.0	6.630
376.0	5.740	525.0	6.630
378.0	5.750	530.0	6.630
380.0	5.740	535.0	6.630
382.0	5.740	540.0	6.630
384.0	5.760	550.0	6.620
386.0	5.750	560.0	6.620

(CONTINUED)

MUQDISHO WATER SUPPLY

STAGE IIA

STEP DRAWDOWN TEST -

PUMPED WELL

PUMPING AT

PW308 GRID REF. 52072277

DATE OF TEST

7 2 34

TIME(MINS)	DRAWDOWN(M)
570.0	6.630
580.0	6.630
590.0	6.630
600.0	6.630



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The Institute of Hydrology is a component establishment of the Natural Environment Research Council